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ABSTRACT

A study examined students' achievement in vocabulary development under two modes, teacher directed instruction and computer-assisted instruction. The subjects--38 seventh graders who had a one to three year vocabulary deficit, according to the "Iowa Test of Basic Skills" pretest in vocabulary--were divided into two groups, Sample A (control) and Sample B (experimental). Sample A was given vocabulary instruction using the computer program, while Sample B was given the same lessons using the print-out from the computer. The computer corrected the control group and the students corrected the errors with the class in the experimental group. Results of the study showed no significant difference between the two methods of instruction. However, there was a slight difference in favor of the experimental, teacher-directed group, showing that computer-assisted instruction is an educational tool but not a replacement for teachers. (An appendix contains lists of the 38 students, their pretest scores, and copies of the vocabulary tests that they were given.) (DF)

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SEVENTH GRADE VOCABULARY COMPUTER INSTRUCTION VS CLASSROOM INSTRUCTION

by

JO ANN L. ALFANO

Accepted 5/13/85

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Kean College of New Jersey
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ABSTRACT

This study examined students' achievement in vocabulary development under two modes: teacher directed instruction versus computer assisted instruction.

The samples were selected from a middle class surburban-urban area. All of the students were in the seventh grade and had a one to three year vocabulary deficit, according to the Iowa Test of Basic Skills pre test in vocabulary.

Two groups were formed and labled Sample A - the controlled group, and Sample B - the experimental group.

Sample A was given vocabulary instruction using the computer program, while Sample B was given the same lessons using the print out form from the computer. The computer corrected the controlled group and the students corrected the errors with the class in the experimental group.

The results of this study concluded that there was no significant difference between the two methods of instruction. However, there was a slight mean difference in favor of the teacher directed group.

This study was undertaken as an attempt at providing evidence of vocabulary development for seventh grade remedial readers by comparing the results of Computer Assisted Instruction to teacher directed instruction and reinforcement.

Statement of Problem

Do seventh grade remedial readers, evidencing a low-average ability in vocabulary, learn more rapidly through the computerized instruction program or the teacher directed activities program?

Hypothesis

There will be no difference in vocabulary development for a sample of low-average seventh graders given computerized remedial instruction when compared to a second sample given teacher directed activities, using the same word list.

Significance of Problem

For years now, computer have entered the classrooms attempting to enhance the learning environment of its students.

Harold Strang (1972) along with Robert Frazier and Susan Zaslav (1970) have conducted studies which show that Computer Assisted Instruction (CAI) does in fact have positive affects on the learning environment for disabled learners.

This study, on the other hand, is being conducted to determine if there is a significant difference between

Learning vocabulary meanings through a computer (requiring a one letter, one number or one word response), or a teacher directed activity which enables the child to physically write the words and interact with the class.

Definitions

CAI - Computer Assisted Instruction - refers to a special computer program which adapts to the individual need of each student in each strand.

Strand - An area of instruction structured into the computer curriculum.

TP - top out - the term used when the student has reached the maximum score in any strand.

CCC - Computer Curriculum Corp. - publisher of the teacher's handbook for Reading for Comprehension.

Average-low - ranking of students whose Iowa Test of Basic Skills scores fall below the 33rd percentile in this district.

ITBS - Iowa Test of Basic Skills - standardized test used in this district, also used for placement level of students. (le. SCE or Chapter I remedial program)

SCE - State Compensatory Education - remedial program funded by state.

Chapter I - formerly Title I - remedial program federally funded.

Surburban/Urban Area - the classification given to the district studied by the state evaluation committee.

ASSUMPTIONS

It is assumed the Iowa Test of Basic Skills scores can be used as an accurate measurement to place students in this remedial program.

It is assumed that the pre and post tests will accurately measure the vocabulary development or growth of each student.

It is assumed that the selection of words by the computer company will accurately represent the vocabulary for each grade level.

It is assumed that the teachers involved will not effect the test scorew and have a good rapport with the students.

LIMITATIONS

This research is limited to the average to low seventh grade student in need of vocabulary remediation as defined by the achievement score on the Iowa Test of Basics Skills. Only students with an estimated third to sixth grade vocabulary level will be used in this study.

PROCEDURES

A group of seventh grade students was selected showing a one to three year dificiency in vocabulary. The vocabulary levels were determined from the October pretests given: the Iowa Test of Basic Skills and the Botel Test of Word Opposites.

A third test, Computer Vocabulary Synonyms, was

designed and administered in a similar fashion to the Botel Test of Word Opposites to obtain the students prior knowledge of the words to be studied. This word list was compiled from the teacher's handbook for Reading Comprehension, grades three to six. The pretest was administered in February to both samples over a two day period.

All the pretest scores, from all three tests, were placed on a chart for each student and assignment to sample was made.

Sample A, consisting of students given remediation through the Computer Assistant Instruction lab only, was designated the controlled group.

Sample B, the experimental group, was given vocabulary remediation in their regular reading class using the same word list utilized in the computer lab in print out format.

Each group worked approximagely 20 minutes a day on the assigned lessons.

In April the students were post tested using the Computer Vocabulary Synonyms Test utilized for pretesting to determine what mean score difference, if any, between the samples existed as a result of the differential instructional modes. A t test was used to test the significance of the difference between the means.

RESULTS

The students were grouped according to the Iowa Test

of Basic Skills pre test, using the vocabulary grade equivalent scores. The test was administered in October, 1984. Table 1 illustrates the mean, standard deviation and t for Samples A and B.

TABLE 1

IOWA PRE TEST SCORES IN VOCABULARY

GROUP	MEAN	STANDARD DEVIATION	t
Sample A	5.97	.99	.09
Sample B	5.91	.79	

Table 1 shows there is no significant difference between the two groups in vocabulary knowledge.

The Botel Test of Word Opposites was also used to establish a vocabulary level on the two groups. This pre test was administered in September 1984 and also gave a grade equivalent score. Table 2 illustrates the mean, standard deviation and t for both samples.

TABLE 2

BOTEL PRE TEST SCORES IN VOCABULARY

GROUP	MEAN	STANDARD DEVIATION	t
Sample A	5.11	.98	.36
Sample B	5.22	.89	

Table 2 shows there is no significant difference between the two groups according to the Botel measure of vocabulary scores.

In order to measure the vocabulary development for the two sample groups a pre test was given to establish a computer vocabulary score. This test was titled the Computer Vocabulary Synonym Test, given in February 1985. Table 3 illustrates the mean, standard deviation and t for the sample groups.

TABLE 3

COMPUTER VOCABULARY PRE TEST SCORES

GROUP	MEAN	STANDARD DEVIATION	t
Sample A	4.05	.91	.34
Sample B	3.95	.97	

Table 3 Shows there is no significant difference between the two groups in the prior knowledge of the computer vocabulary words in this program.

To estimate the vocabulary growth between the two samples a post test on the Computer Vocabulary Synonyms Test was given in April 1985. Table 4 illustrates the mean, standard deviation and t for the two sample groups.

TABLE 4

COMPUTER VOCABULARY POST TEST SCORES

GROUP	MEAN	STANDARD DEVIATION	t
Sample A	4.42	1.12	.89
Sample B	4.74	.87	

Table 4 indicates there is no significant difference

between the two samples in vocabulary development. However, there is a slight mean difference in favor of the teacher directed group, Sample B.

CONCLUSIONS AND IMPLICATIONS

Upon examination of the collected data for this study, it was concluded that there was no significant difference in achievement in vocabulary as measured by the synonym test between samples using either computer assisted instruction or teacher directed instruction. The hypothesis that there would be no difference is supported and therefor it is concluded that the modes of presentation of vocabulary material, that is, on a monitor screen with computer assisted scoring and grading or the same material, computer generated and printed but directed by the teacher, are essentially the same in so far as instructional effects are concerned. There is no significant difference between the two forms of presentation.

It should be noted, however, the same teacher directed sample appeared to enjoy their work activity more and did achieve slightly more. Perhaps the interaction with the teacher and/or the satisfaction attained from working in a familiar, i.e., workbook, format, though computer generated and printed, produced the apparent enjoyment and concomitant greater, though small, achievement.

Further study should be undertaken to continue the assessment of the value of Computer Assisted Instruction. It seems obvious that the minor differences in achievement in the study happened by chance and that vocabulary exercises can be handled by a computer directed programs

relieving the teacher for more professional activities. This possibility, alone, merits computer use.

Computer Assisted Instruction: Related Literature

The research availabel on computers and reading instruction is increasing daily. However, research dealing specifically with vocabulary growth is not as prevalent.

The study done by Carol L. Balog in 1981 regarding the immediate feedback of the computer and its impact on reading shows that CAI does enhance the learning environment of the disabled reader.

Though the reasons varied between cognitive and behavioral theory, the end results was a positive one when CAI was instituted.

Balog, in her research, describes a study conducted in Maryland by R. I. Fazier and S. S. Zaslav which is closely related to the study currently being conducted. Frazier and Zaslav used a nonautomated electric typewriter to teach words from the Dolch list and the school's basal reader. Twenty-two second graders at least one year below grade level in reading were used. One half of the sample was given CAI. the other half was not. Test scores at the end of the study showed a two year gain for the CAI group as opposed to a one year gain for the other.

Frank H. Heppner along with three other colleagues from the University of Rhode Island, in Kingston, reported in their study of reading performance on a standardized test, that their subjects did better on tests from print than from computer display. They said that the participants expressed strong subjective beliefs that they could read

the print material faster, with more comprehension.

The population tested was from the university's students, staff, and faculty, using the Nelson-Denny Reading Test (Riverside 1960).

The subjects were broken into two groups, "A" and "B". Group A worked on the computer for the first part of the test while Group B worked from the printed page material. After twenty minutes they were stopped and asked to switch places to complete the test.

The results, scores were significantly better on the print forms than the computer forms. Students who indicated regular computer use, either by profession or as student programers, showed a larger difference between computer and print scores, when compared to the group as a whole. The researchers believe this suggests that computer familiarity does not alter the relative differences in performance scores. What they did state was interesting about this factor is that regular computer users had much better scores on both computer and print formats than nonusers.

Further proof supporting the idea that regular computer use helps to improve standardized test scores comes from several school surveys conducted by Instructional Systems, Inc. in Englewood Cliffs, N.J.

The statistics included samples from New Jersey and New York ranging from grades two to six, and one handicaped group. The standardized tests used in the various school districts were the California Achievement Test, Iowa

Achievement Tests, Stanford Achievement Test in Reading, Metropolitan Achievement Test and the Iowa Test of Basic Skills.

The tests primarily showed that the students with CAI did exceed the scores of the students without CAI, in reading and in math.

They also stated that the time on task did vary and may have played some parts in the results.

Computers have also been used by the U.S. Army and Navy to assist their literacy efforts (Blanchard 1985). The initial research has shown the literal comprehension skills improve about as much as would be expected from noncomputer generative exercises, but in about half the time.

Areas of computer assistance cover vocabulary development, problem solving using historical film and animation by simulating time travel. This transports the user to another setting and has them apply newly learned functional literacy skills to solve a problem. Study skills, land navigation, sentence arrangement, paragraph organization and missing word strategies are also a part of this innovative project.

William H Rupley and Patricia Chevrette (1983) reassure teachers that the question of computers replacing them is no longer valid. Instead, they are seen as a valuable instructional tool which offers more variety in learning tasks. Their article also states several reasons why

students in a CAI reading program have higher achievement in reading than those only using a traditional basal reader approach.

1. The care and skill with which the CAI programs are designed to give individualized instructions with immediate feedback.
2. The student is motivated through success which leads to the development of a more positive attitude and a more pleasurable learning experience.
3. Students working at a computer terminal are more likely to be actively engaged in the learning task for the duration of the lesson, contrasted with when working in seats or individually.
4. Research also shows that time on task is another main variable related to student achievement in reading. This active engagement is essential to the learning process and support for this statement is found in studies done by Duffy (1980), Brophy (1979), Gilman, Blair and Rupley (1981).

O'Donnell (1982) concurs that if properly used, computer assisted instruction seems to have a positive influence upon student achievement. She describes the "computer managed instruction" (CMI) by citing Moursand (1980):

> "Computer managed instruction is the use of the computer as a record keeper, idagnostic tester, test scorer, and prescriber of what to study next."

She concludes that botn CAI and CMI can enhance teaching and learning, especially as they are becoming more readily affordable and as more instructional programs are developed and refined. Thus giving more schools the opportunity to experiment with computers to learn their potential as well as their limits.

The CMI program was used for five years in the Belvedere-Parkway Elementary School, in Calgary. Tests results did show better reading achievement and improved attitudes towards learning.

Balajthy (1984) cites interesting advice on how to select the appropriate software for students and says that excellent materials for reading can be found in programs designed in the content area.

In the article "The Computer vs Real Reading Instruction" (Kastler and Roser 1982), real reading is defined as "contact with print for a purpose." They go on to say that a child may have fun playing as s/he is learning, however, some children lack the adequate experiential background needed to learn to read. Therefore, reading must be presented so that the purpose(s) of print are clear.

Kastler and Roser cite three characteristics of "real reading instruction" :

1. Readers have a purpose for reading.
2. There is a exchange or interaction between language and print.
3. There are opportunities to respond to their reading in a variety of ways to extend the print experience.

In conclusion, this article states that technology in the classroom is a certainty, and has become an option practice. However, teacher-pupil exchange is still the basis of instruction.

Not all research is in favor of this new wave of technology. In an atricle titled "The Case Against the Classroom Computer," by Antonio Gollan (1980), the computer's true value in class is questioned. One point made is that computerized education relizes mainly on stimulus-response learning, much like the discarded "teaching machine" developed by B.F. Skinner after World War II.

Another point made is that student input is only limited to brief responses registered by touching a keyboard, which does not allow for the same thought processes as writing an essay. Gollan continues by citing Hartoonian, who states that writing requires reasoning on a more advanced level, which becomes more formal as students prepare written presentations.

However, the behavior modification of the stimulus-response approach to education rejects the development of reason.

Concluding this article with a comparison to research done on teaching using television, he cites the Emerys. Their study suggested that the very act of watching television, no matter what the programming of subject matter, can interfere with analytic thought. Too much technology can decrease creativity (B.F. Skinner).

Finally, Gollan suggests that computer and television are, intrinsically, media of authoritarianism; the printed word is an instrument of liberty. He further claims that the most remarkable computer is the human brain.

James B. Parsons' article "The Seductive Computer; Can It Be Resisted?," seems to agree with Gollan's study. Parsons claims that the interaction between a computer and its user does not work towards the creation of meaning. He feels it is just a means of retrieving information. His concern is that computers will create the needs instead of providing for the individual needs.

The January 1985 issue of the NJEA Review contains a report which identifies New Jersey's computer needs. The survey was released from Trenton.

The findings of his report show that school districts in high socioeconomic categories have more experience with computers than those in less wealthy districts. There is

a lower student-to-computer ratio as well, in the wealthier areas. The average New Jersey school contains 59.9 students for every microcomputer or computer terminal.

They further state that the results of this survey will be used by the Department of Education to help regional curriculum services develop computer applications, set up user groups by specific content areas and establish a computer network among districts. They are also working on a survey of computer hardware, soon to be released.

SUMMARY

The research gathered thus far has shown that CAI is a viable teaching option, not a replacement for the teacher. Computers do help to increase standardized test scores. Some of the positive statements cited to give evidence of this increase are factors such as immediate feedback, extended time on task, more active participation and good motivation. The U.S. Armed forces shows that the same amount is ultimately learned, but in half the time.

Still others feel that too much use of technology can decrease one's creativity and does not require an advanced level of reasoning, such as writing.

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APPENDIX

TABLE 1

SAMPLE B - EXPERIMENTAL

STUDENT	PRE TEST IOWA-VOC-G.E.	PRE TEST BOTEL-VOC-G.E.	PRE TEST COMPUTER-VOC	POST TEST COMPUTER-VOC-G.E
1. Daniel	4.6	5	3	5
2. Dalia	5.9	5	3	5
3. Joseph	4.9	4	3	4
4. Cherie	6.1	7	5	6
5. Donielle	6.2	6	5	5
6. Josephine	4.6	5	4	4
7. Urmella	6.2	6	3	5
8. Kristen	5.9	5	5	5
9. Gerard	5.2	3.2	3	3
10. Mike	5.2	5	5	5
11. Marisol	6.2	5	3	3
12. Doniella	5.7	4	3	4
13. Mary	6.4	5	3	5
14. Steve	6.6	6	5	4
15. Jennifer	6.7	6	4	5
16. Dorothy	6.7	5	5	5
17. Jeff	6.4	5	5	6
18. Rachael	6.7	6	5	6
19. Renee	6.7	6	3	5

The above chart shows the pre and post test scores for Sample A, the group with out computer assisted instruction.

TABLE 2

SAMPLE A - COMPUTER ASSISTED

STUDENT:	PRE TEST IOWA-VOC- G.E.	PRE TEST BOTEL-VOC-G.E.	PRE TEST COMPUTER-VOC	POST TEST COMPUTER-VOC-G.E.
1. Scott	7.2	6	5	5
2. Dennis	6.1	6	3	5
3. John	5.2	5	3	3
4. Paul	6.6	6	5	5
5. Sharonda	6.1	6	4	6
6. Tammy	5.9	4	3	4
7. James	6.1	6	4	3
8. Tammy S.	6.4	6	4	4
9. Daniele	5.2	4	3	3
10. Kelly	7.0	6	4	6
11. Toni	6.1	5	6	6
12. Bibi	3.5	3	3	3
13. Nick	3.8	4	3	3
14. Tabatha	6.7	5	4	4
15. Guadalope	5.9	4	4	4
16. Eugene	6.9	5	5	5
17. Mike	5.7	4	5	5
18. Renee	6.1	6	4	4
19. John S.	6.9	6	5	6

The above Table shows the pre and post test scores for Sample B, the group with computer assisted instruction.

NAME_____DATE_____PERIOD_____

COMPUTER SYNONYM VOCABULARY TEST

DIRECTIONS: Read each row across. Find the word that is the same or nearly the same as the first word that is numbered. Underline your choice

---

I.

1.	trick	treat	joke	smile	laugh
2.	wise	smart	dumb	wild	inch
3.	start	knee	finish	stare	begin
4.	few	magnet	fly	a little	many
5.	gentle	harsh	mild	gem	rather
6.	doubt	sure	double	unsure	safety
7.	narrow	thin	thick	naval	scamper
8.	wander	roam	stay	wonderful	patient
9.	valuable	costly	cheap	vain	oxygen
10.	quarrel	fight	rock	friend	enough

II.

1.	agriculture	agreement	farming	canyon	city
2.	declare	state	ask	discuss	gallop
3.	coarse	rough	carve	material	smooth
4.	disguise	disgust	recognize	hide	lash
5.	hesitate	wait	continue	mistake	juice
6.	nation	notion	city	country	state
7.	jealous	genuine	envious	material	faint
8.	particular	serious	special	patience	material
9.	shiver	shiny	shake	motionless	ghost
10.	urge	influence	stop	weary	ugly

VOCABULARY TEST A

III.

1.	achievement	accomplishment	coax	failure	reputation
2.	dehydrate	moisture	fatigue	dry	pallid
3.	blunder	succeed	mistake	banish	humiliate
4.	gadget	device	giggle	liquid	gravity
5.	capsize	pill	upturn	capture	overturn
6.	cautious	careless	nitrogen	careful	serene
7.	observe	obstacle	see	listen	amuse
8.	sequence	symbol	tournament	order	ultimate
9.	vicinity	vacant	area	vivid	survey
10.	quarantine	quarry	isolate	spread	indignant

IV.

1.	abolish	abound	end	combat	save
2.	desolate	deserted	occupied	feat	kindle
3.	predicament	prejudice	uneasy situation	satisfying	mangled
4.	nonchalant	happy	zeal	nomadic	disinterested
5.	obese	slender	sullen	fat	obsolete
6.	frugal	wasteful	fresh	notable	economical
7.	mutilate	manipulate	deform	fix	exert
8.	eliminate	durable	exhilarate	remove	replace
9.	adversary	argument	colleague	arid	enemy
10.	crevice	solid	crack	gauge	morsel